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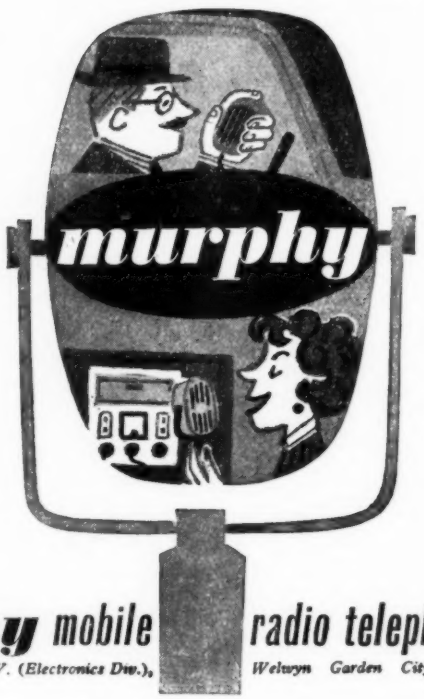

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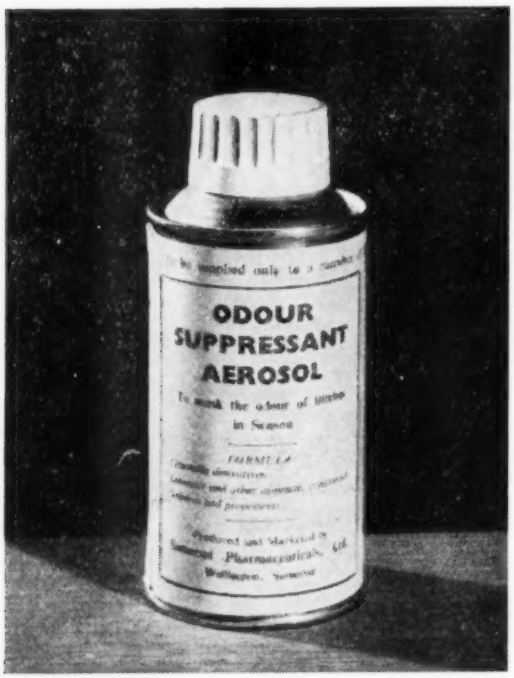

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The President's Address to the Association

At the Annual General Meeting of the British Veterinary Association, held in the Metropole Hotel, Folkestone, on August 31st, the President, who was received with sustained applause, delivered the traditional Address. Mr. Hebeler said :—

WHILE many regard this Address as an occasion for the President to reveal those indiscreet inner thoughts he may have been smothering for months past it is as well to remember that his successor does expect him to remain one of the team of officers for one more year, after which time he can sink into the limbo of those who have had, but missed, the opportunity of creating a sensation in the modern manner. The temptation to follow this course has been easy for me to avoid in view of the considerable events in the past year which are landmarks, great and small, in the history of the Association and of the profession.

Since the printing dispute has made it possible to issue a full Annual Report only just in time for Congress it may be of added interest if I refer to some of these matters from the position of one who has been privileged to see much of what has occurred from very close quarters.

Publication of results is well known to be not only the currency, but also the life blood of scientific research. It is common knowledge that the volume of this work has increased enormously, particularly during the past 10 years, so much in fact that the available space in journals has been unable to meet the situation and the consequent delays in publication have produced many difficulties for research workers. In addition, space in certain journals has been taken up by work not entirely suited to the character of those journals. Some subscribers have considered that THE VETERINARY RECORD has contained too many articles devoted to fundamental research and not enough of general interest; I would not specify clinical articles since the presentation of these lies mainly in the hands of members in practice. For these and other reasons your Council has accepted the suggestion of the Editorial Committee that the Association should produce a quarterly journal devoted to research in a wide field covering veterinary interests. Considerable progress has been made already in preparing for the first issue of *Research in Veterinary Science* in January 1960; an advance notice was among the papers circulated at the International Veterinary Congress and excited much interest.

The contents of the journal are in the hands of an Editorial Board which contains many distinguished scientists from the veterinary and other professions, and the Association is grateful to them for undertaking the heavy task of supervision of a publication which is intended to be of the very highest quality both in appearance and content.

I hope that this venture will receive the warmest support from members of the profession both as contributors and subscribers. It has been suggested that it may have a deleterious effect on already established journals. This fear would seem to be unfounded when one considers the volume of papers now presented for publication and the delay which occurs before their appearance in print. The secretary of the Agricultural Research Council stated recently that what was holding up research in general was not shortage of equipment but of manpower, and as the situation improves there will be an increasing demand for publication space. It is to meet this situation that *Research in Veterinary Science* has been founded.

While I am speaking on the subject of publications which now form such a large part of the Association's activities, I would wish to draw your attention to the efforts of our staff to provide some sort of substitute RECORD during the printing strike and to the fact that the inevitable result of this strike will be an increase in cost of publication. When one considers that the net cost of supplying THE RECORD free to every member is well over half the annual subscription, and when the vast range of services expected from the Association by its members is reviewed, it must become obvious that the Finance Committee, during the next year or so, will have to consider very seriously the question of the membership subscrip- which was last increased as long ago as 1947. Since

the Association was successful this year in proving its status as a scientific society in the terms of the 1958 Finance Act it may be that any increase in a subscription now exempted from Income Tax may not be viewed too hardly by members.

The Calf Vaccination Scheme

We owe much to our scientific workers for the improvement of our scientific status, but we must not forget the valuable part played by the majority of the profession in the careful application of these scientific results. During the past year much attention has been paid to the question of the vaccination of cattle with S19 abortus vaccine from the point of view of both the financial and practical applications of the official Calf Vaccination Scheme. This scheme is now largely out of date owing to its close links with quarterly inspections and annual tuberculin testing of herds—intervals of time which have increased and which will do so still further as tuberculosis eradication proceeds. In addition the evidence from Compton that vaccination should only take place during the sixth, seventh and eighth months of life to give satisfactory immunity and avoid the production of circulating antibodies in adult life, coupled with the evidence from Northern Ireland and the Netherlands that vaccination of adult cattle can lead to the excretion of apparently virulent strains of *Brucella abortus* in the milk, should give all those concerned with the use of S19 vaccine reason to reflect very carefully on its use.

There is no suggestion that policy in matters of the eradication of animal disease should not lie in the hands of the Ministry of Agriculture, but all scientific workers benefit by holding opinions and occasionally airing them. It is my firm personal belief that, of the serious endemic and epidemic animal diseases now causing loss and unhappiness to farmers and members of the public in this country, contagious abortion is still underestimated in its public health significance. Furthermore, it is the one which can most satisfactorily be eradicated in the light of present knowledge; since we have a highly efficient prophylactic agent and a most accurate means of diagnosis in the herd and in the individual animal. It is interesting to note here that in the past eradication programmes have been carried out by diagnosis of the condition and slaughter of the affected animals and possibly also the contacts. It would seem that, in future programmes for the eradication of the major diseases now existing, prophylaxis will play a great part and I suggest that this will require a considerable alteration of thought in facing the problem. With regard to contagious abortion it would seem that the early institution of a scheme of universal vaccination of female stock at the correct age, together with a reduction of vaccination of adults except under the most careful control, is an indispensable preliminary to any eradication scheme which may later become official policy. Such an arrangement has been the subject of a resolution adopted by your Council and undoubtedly presents obvious difficulties, but I cannot believe that they are insoluble to a Department which has so rapidly and successfully dealt with tuberculosis eradication in a period far shorter than many earlier prophets believed possible. Once again, I think we should pay tribute to the Chief Veterinary Officer, the Animal Health Division, and all my colleagues in practice whose hard work in the appalling conditions of last winter has helped to bring the scheme so near its final stages.

The Zoonoses

An audience such as this is familiar with many aspects of the zoonoses but, since the courtesy of the Press brings this address to many far outside the profession, I make little apology for making reference to some of those diseases of animals which are communicable to man. They are of ever-increasing interest to us and we welcome their joint study with our medical colleagues. In this country, particularly now that bovine tuberculosis is nearing eradication, their importance is not so obvious and their occurrence is often occupational, but nevertheless they are preventable. The incidence of contagious abortion in its human form of undulant fever does not seem to decrease in spite of the increase of milk pasteurisation. The earlier hopes of antibiotic treatment have not been fulfilled so that the condition in man remains one which causes a long absence from work. Weil's disease is still common in many country areas and its association with infected dogs as well as rats may well eventually bring more universal prophylaxis in this domestic animal. The reservoir of human ringworm infection is now, I think, accepted as the animal population, and further investigation is being actively carried out by members of both professions. Much speculation exists with regard to the infectivity of animal viruses for humans but it has been shown that the disease known as orf in sheep may be contracted by man, and there is evidence suggesting that the virus causing louping-ill has a connexion with some cases of human meningitis.

The salmonella group of organisms, which cause serious disease in animals and poultry, may well have a large place in food poisoning outbreaks in the human population. These have been the subject of many investigations which might have been more fruitful if the rightful place of our profession in the food inspection services were recognised and effected. In common with my predecessors I fail to understand the attitude of authority, which almost excludes veterinary surgeons from official participation in meat inspection, the greatest daily application of the science of applied animal pathology, but which has gone so far as to admit our value in matters of slaughterhouse hygiene and cruelty. It is true that members up and down the country are assisting in local arrangements for meat inspection and the Association would encourage them to do so, but without centrally organised veterinary assistance no complete and accurate *post-mortem* picture of animal disease can be obtained. Such information is going to be essential in maintaining a national herd free of tuberculosis, and the extent and severity within areas of such conditions as liver fluke and hydatid cysts can lead to measures being taken for their control.

In the realm of surgery much has been published

of late on new techniques in the surgical correction of diseases of the human heart, and it is interesting to note that a great deal of the investigation of these methods has been carried out at veterinary hospitals in collaboration with members of our own profession.

The Profession in Civil Defence

Since the period of office of the President is brief it frequently happens that the ball he started rolling, or may be pushed in passing, only reaches its goal at some much later time. I am in the happy situation of being able to report the culmination of the efforts of my predecessors, particularly Mr. Ingram, with regard to the position of our profession in Civil Defence which has been of much concern owing to the lack of special direction. In February of this year a 3-day study course was arranged by the Ministry of Agriculture at the Civil Defence Staff College; this was attended by a most representative cross-section of the profession which gave careful attention to our position in the light of certain information about the general problem. No decisions have been reached yet, but there is obvious acceptance of the vital part we must play in the national organisation and we would welcome definite and early guidance as to our rôle; I know that, when this is decided, there will be no hesitation on the part of any member in coming forward for training to carry out those duties he should properly undertake.

Having referred briefly to our work in the realms of public health I would now widen my view in connexion with matters of the service of the profession to the community and our present deployment. At the moment private practice has strong financial inducements to the new graduate due to eradication schemes, the comparative prosperity of agriculture and, not least, the pleasure of the successful practical application of modern knowledge, and I should be the last person to wish these reasons to change. Research workers are also being recruited more easily, perhaps as a result of modern methods of education and the fact that they are no longer expected to live on bread alone. The result of this is that some of the positions previously considered safe for a life's work are now under-manned and it is unfortunate that these positions are sometimes those in which the profession has done much to uphold and advance its status. The veterinary services overseas have suffered under the pressure of present conditions although it would be idle to deny that internal events in overseas territories have sometimes added to other difficulties. The Royal Army Veterinary Corps, having been reorganised and facing the end of an admittedly not very happy system of National Service, must take in young veterinary surgeons on a career basis to fulfil its new functions.

I do not believe that the quality and spirit of young graduates has altered so much that the challenge presented by the work in both these services will go unheeded, and improvements in the material conditions now offered should aid increased recruitment. In some places, not only the prestige of the profession but also that of the country depends on this and the Association must continue to pay attention to the urgent necessity of encouraging its younger members to make a career in this work.

The International Congress

In May of this year the Sixteenth International Veterinary Congress was held in Madrid, nearly 2 years after the date originally planned for it at Buenos Aires. The attendance of well over 3,000 was far in excess of any previous Congress, and I would like to pay tribute to the Spanish organising committee whose arrangements, made in about one quarter of the usual time, were excellent in the circumstances and produced what was generally considered a most successful Congress. I am grateful to the Association for sending me as its representative, and it was with great satisfaction that I noted the large number of members present from the United Kingdom and the Commonwealth, many of whom were attending in a private capacity and at their own expense. Their contribution to the proceedings was considerable and valuable, and the whole Congress emphasised yet again that the differences of internationl politics are forgotten when people of similar interests and vocation meet together; the discordant note was obvious on the few occasions when national ideologies were introduced in the discussions.

You will have noted with pleasure the appointment of Professor Beveridge as president of the World Veterinary Association, formed at the Congress, after a most successful term as chairman of the Permanent Committee, and it is my view that the formation of specialist international associations in the various disciplines and their integration in the planning of programmes for future world congresses can do nothing but good in securing papers and demonstrations of the quality needed to maintain the prestige of such occasions.

Some Problems of Private Practice

As one who has spent his whole professional life in private practice, albeit sporadically during the past year, it is not surprising that I should wish to say a few words about that way of life. It is one of the finest examples of service, in the best definition of that word, to be found in this country to-day, and I would think it wrong for anyone not prepared to give this service to remain in practice simply because it is a way of earning a living. I have referred already to the weather conditions of the past winter and previous summer and autumn; even the fine weather of the past few months cannot obliterate the memory, or their effect on stock or in the minds of agricultural practitioners. The efforts of these practitioners were instrumental in many cases in saving greater losses and maintaining production in spite of the widespread incidence of metabolic disease, parasitism, foot troubles and other conditions connected with the long wet spell. I am sure the degree of this service is generally recognised by the farming community, but I sometimes wonder if they realise its full extent. At times they seem to expect too much having regard to the increasing number of calls for special attendance purely to meet their personal convenience. These peremptory demands seem hardly to combine with the continual sniping

on the matter of the cost of veterinary service. It is not possible to decrease costs under present national conditions and the necessity of using the more costly specific drugs available now to produce the rapid result required by the animal owner. It is only by the use of modern aids to efficiency that the veterinary surgeon has been able to cope with more daily work than previously and at the same time keep fees from rising above their present level, which is still below the comparative increase of most other services since the days of 1939.

One may be surprised that even to-day many people connected with agriculture apparently fail to realise that accurate diagnosis is the key to successful and, just as important, economic treatment or prophylaxis. Such ignorance must surely be the cause of the unthinking demands, which we all constantly hear, that drugs and vaccines, many of them dangerous except in skilled hands and most of them too expensive to be used wastefully, should be fully available to farmers. I am sure that we are right, and the pharmaceutical industry is right, in maintaining that these agents should be supplied only to veterinary surgeons or upon their prescription. On the other hand this confers upon us a serious responsibility and we must take good care that no just reproach can be levelled at us regarding the cost of these substances supplied to our clients. Your Association has always insisted that the unprejudiced diagnostic and advisory services of veterinary surgeons in practice are indispensable to a healthy agriculture. The most valuable veterinary work on the farm is continuous and the modern farmer should budget to pay our proper fees for these services and not regard them as an unwelcome extra in his annual accounts. Nor should he be deluded by the growth of so-called "free" services in certain directions; the British farmer, above all people, should know that very little is really free to-day!

The Use of Antibiotics

The failure of some dairy farmers to appreciate the value of advice or the far-reaching effects of the modern simple methods of treatment of mastitis in cattle has led to serious difficulties in the milk processing industry owing to high antibiotic levels in milk coming off some farms. One may expect some action to be taken to control this situation especially as it sometimes also has serious repercussions on human health. Those who raise the cry of restriction or monopoly should study the arrangements in Denmark, where the agricultural economy is equally admired and feared by many British farmers. In that country no antibiotic may be used except by a veterinary surgeon who must immediately report its use to the milk collection centre and the farmer is prohibited from selling that milk for 7 days after the last treatment. These rules were not imposed by the veterinary profession but by the farmers' co-operatives which handle the milk industry.

It is also a matter of concern that, when the Association tries to help veterinary surgeons and their clients to achieve the ideal of accurate diagnosis and effective treatment and prevention of disease by supporting legislation requiring the declaration of drugs and their quantities in animal feeds, it is said to be attempting control of industry. This, of course, is just as ridiculous as to suggest that the profession is not interested in animal health but only in disease.

In the sphere of small-animal practice the Council has been pleased to welcome the British Small Animals Veterinary Association as a Division, and I was especially pleased to note the prominent part some of its members have taken in the formation of an international association. For many years now the Presidential Address has contained some reference to the animal welfare societies and our unresolved differences with some of them. It would be inappropriate for me not to make reference to this matter and indeed I am happy to be able to say that some small progress has been made in certain directions and that discussions are proceeding quietly in other matters. I have every confidence that all the points of difference can be settled given goodwill. It has been immensely encouraging to find this goodwill among our colleagues concerned with these matters. Nothing gives me greater pleasure on this occasion than to thank them on behalf of the Association and the whole profession. I do not wish to be more specific in this matter but I would ask the confidence of all members in those who are carrying these discussions forward towards an end which can only be of advantage to the animals concerned.

The "End of an Era"

It is perhaps sad to close this Address with reference to the impending end of an era, but many of you will know that the General Secretary, Mr. Knight, will retire next year after 35 years' service to the Association during which time he has helped it to grow in size, importance and influence. This is not yet the occasion to pay full tribute to his work but, while I am still President, I would wish to thank him personally for the support and friendship he has given me since I first became an officer of the Association 9 years ago. Your Council decided that it would be in the best interests of the Association and the profession to secure the services of a veterinary surgeon as secretary and chief executive, and it gives me great pleasure to announce that Mr. John A. Anderson, M.R.C.V.S., has been appointed. The range of duties envisaged for him and, may I say by him, cover a wider field than ever before and include that much misunderstood branch known as "public relations." I have no doubt that, with his record of experience within and outside the profession, he will be able to achieve much which will raise the Asociation still higher in the esteem of those who already know its worth, and bring it to the attention of those who are still ignorant.

At this conclusion of what has been a most memorable year for me nothing gives greater satisfaction than to be able to thank, in public, those who have also borne the heat and burden—my fellow officers, the standing committees and Council, and our permanent staff. In many ways the past year has not been an easy one but the aura of goodwill which surrounds the President is one of the most sustaining experiences of his life. Anyone who doubts

(*Continued at foot of col. 2, page 610*)

A Method of Forecasting the Incidence of Fascioliasis in Anglesey

BY

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SUMMARY.—A relationship between the incidence of acute fascioliasis and climate on Anglesey has been established. The incidence of disease has been assessed from data obtained at the Veterinary Investigation Centre in Bangor ; that of climate from relevant meteorological data. Whilst neither the method of estimating the incidence of disease, not that of assessing the effect of climate on the development of the parasite is regarded as infallible, it is considered that there is sufficient correlation between the two over the 10-year period between 1948-57 to enable a reliable method of forecasting the incidence of disease to be made. This would be of use in improving the present measures for disease control.

AN association that exists between the incidence of fascioliasis and climate in this country has been outlined by Ollerenshaw (1958). Three main disease patterns in relation to climate were distinguished, their distribution being on hill farms, on lowland farms in Eastern England, and on lowland farms in Wales and Western England. The disease pattern existing on lowland farms in Wales and Western England presents the most serious aspects of the disease, since it is on farms in these areas that outbreaks of acute fascioliasis in sheep are commonly encountered.

The shortcoming of existing methods for controlling fascioliasis, apart from drainage, is the necessity to implement them each year in anticipation of disease which may never materialise. Obviously there is need for a system of forecasting the incidence of disease which could be used as the basis of a worthwhile warning system for farmers. Control measures appropriate to the pending incidence of the disease could then be undertaken.

With this object in view, a detailed investigation into the relationship between climate and fascioliasis has been made in a county representative of the areas of worst infestation, to determine whether a sufficiently close correlation exists to enable the incidence of the disease to be predicted with accuracy.

In planning a pilot scheme, it was necessary to select a county where the disease was of economic importance, where information as to its incidence over a number of years could be obtained, and where climatic variations were similar over the whole area. In this way the precise nature of any relationship which might exist between climate and the incidence of disease was more likely to be ascertained.

The county of Anglesey was chosen with these facts in mind, using the data available at the M.A.F.F. Veterinary Investigation Centre at Bangor as a basis for assessing disease incidence. The reports of 5 meteorological stations covering the county provided figures relating to the climatic factors over the period 1948–57.

Environmental Factors Influencing the Life Cycle of *Fasciola hepatica*

The size of any population of *F. hepatica* is dependent on a number of environmental factors, some constant and some variable from year to year in any given area. Factors which are constant from year to year cannot be responsible for annual variations in the incidence of fascioliasis. This incidence is controlled by the variable factors operating on the life cycle either directly, or indirectly. Evaluation of the variable factors is therefore most important, but some assessment of the role of the constant factors is first necessary because they may either facilitate or restrict the development of large populations of *F. hepatica.*

The fact that the disease is of economic importance on Anglesey suggests that the constant environmental factors must favour the development of the parasite. The island is heavily stocked with sheep grazing largely on permanent pasture. Many of these sheep are bought in annually from the Welsh hills already infested with the parasite. These sheep, together with the cattle and (until the advent of myxomatosis) the rabbits, therefore maintain a continuous supply of eggs onto the pastures. Furthermore, the existence of moisture-retaining clay often in association with extensive areas of badly drained land gives rise to many habitats favourable for the development of both the snail host and the parasite. The position in Anglesey therefore, is potentially favourable at all times for the development of large populations of *F. hepatica.*

Whether or not large populations materialise in any year will depend on the variable factors. These variable factors are largely climatic and it is this dependence of the parasite on climatic conditions which ultimately governs the varying annual incidence of fascioliasis and enables the incidence to be related to meteorological data.

Analysis of the Climate

The rate of development both of the fluke egg and of the larval stages within the snail are influenced by

TABLE I
MONTHLY AVERAGES OF MAXIMUM, MINIMUM, AND MEAN TEMPERATURE 1921–50 FOR HOLYHEAD
°F.

	J	F	M	A	M	J	J	A	S	O	N	D
Maximum Day	46·0	45·8	48·7	51·7	56·5	60·8	63·7	64·4	61·6	56·5	50·9	47·3
Minimum Night	39·9	39·1	39·9	42·5	46·1	51·0	54·4	54·9	52·7	48·8	44·2	41·7
Mean	43·0	42·4	44·3	47·1	51·3	55·9	59·1	59·6	57·2	52·6	47·5	44·5
					To nearest °C							
Maximum Day	8	7	9	11	13	16	17	18	16	13	10	8
Minimum Night	4	4	4	6	8	11	13	13	11	9	7	5
Mean	6	6	7	8	11	13	15	15	14	12	9	7

temperature. Even when the infection in the snail is mature, liberation of cercariae is not possible below 9° C. (Kendall & McCullough, 1951). Our investigations show that although development of the fluke egg and intra-molluscan stages of the parasite is possible at 10° C., the rate of development is so slow at this temperature that the use of 10° C. as the critical temperature in the field is valid. The average maximum and minimum temperatures for Holyhead are given in Table I. From this it is apparent that although development is possible from April to November, appreciable development occurs only from May to October.

Moisture is the other critical factor in the life history of *F. hepatica* and it has been shown (Ollerenshaw, 1958) that in those months when rainfall exceeds transpiration, moisture conditions are likely to be favourable for the development of the parasite. To assess the incidence of fascioliasis simply in terms of the number of months from May to October when rainfall exceeds transpiration, though of some value, is clearly an oversimplification, since the distribution of rainfall during each month is of importance. Thus a heavy thunderstorm might result in an otherwise "dry"* month being termed "wet"† in a technical sense, or conversely, a showery month being termed "dry." It is essential therefore to increase the precision of the measurement of moisture beyond that indicated by the difference between rainfall and transpiration. This may be accomplished either by measuring this difference between rainfall and transpiration weekly, instead of monthly (The Calculation of Irrigation Need, 1954) or by incorporating into the monthly measurement already obtained, the frequency of rainfall during the month, by including the number of rain-days‡. The latter offers the simpler solution and the easiest way to combine the two measurements (*i.e.* moisture as indicated by the difference between rainfall and transpiration and the number of rain-days) is to multiply them together thereby giving a single numerical value (M).

In order to ensure that the resulting values for each month are directly comparable, all monthly measurements of the difference between rainfall and transpiration are first increased by a constant, the value of which has been arbitrarily fixed at 5 (for a discussion on the validity of this see Appendix). By this means, a positive value for the difference between rainfall and transpiration is always obtained. (An example of this calculation is given in Table II.)

Under favourable conditions of moisture and with temperatures varying from 15° to 20° C., development of the parasite from the time of deposition of the fluke egg until the cercaria is mature is likely to take about 3 months. Therefore, the monthly values of M obtained above have to be summated before they can be of use in estimating the incidence of disease. Summation of these monthly values (M) without further modification however, could lead to great distortion of the final figure due to the appearance of exceedingly high values for abnormally wet months (*cf.* value of M for August, 1956, Table II). Observations on Anglesey indicate that when the monthly value of M reaches 100, moisture conditions in most habitats, regardless of their previous history, will have been sufficiently wet during that month for the development of the parasite. Accordingly, monthly values of M exceeding 100 are simply recorded as 100.

Even if moisture conditions in the field are optimal throughout the months from May to October, there will still be a varying degree of parasitic development in each month because of varying temperatures. Therefore if the value of M is to be related directly to the potential development of the fluke, it must be adjusted to allow for variations in temperature. Initial observations on Anglesey indicate that a similar rate of development of the parasite occurs during the months of June, July, August and September, whilst in May and October development is reduced by half. The value of M for May and October is therefore halved. An index M_t is finally derived for each month between May and October and this can now be taken as a direct measurement of the potential development of the parasite and the indices may be summated in order to give an estimate of the incidence of the disease*.

It will be seen from Table II that the value of M_t for October is always given as 50, the reason for this

* "Dry" indicating transpiration greater than rainfall.
† "Wet" indicating rainfall greater than transpiration.
‡ A rain-day occurs when more than 0·2 mm. (0·01 in.) of rain falls in 24 hours.

* The values of M_t for the meteorological stations at Valley Holyhead, Llanerchymedd, Aber, and Bangor were calculated, and the average values of all stations with complete data used in Fig. 1. Although Anglesey is not a large county, variations in climate inevitably occur over the island. The monthly values of M_t are given for each station in Table II. It shows that although variations do occur, there is close agreement between the monthly values of M_t for different stations at any particular instant.

TABLE II
METHOD OF CALCULATING M_t FOR METEOROLOGICAL STATION AT VALLEY

Year	May	June	July	August	September	Year	May	June	July	August	September
		Rain-fall in inches	(R)					R−P			
1947	3·16	2·70	2·19	0·71	3·63	1947	0·09	−0·52	−0·99	−2·93	1·84
1948	1·22	3·00	1·08	4·03	2·31	1948	−2·34	−0·19	−2·32	1·67	0·94
1949	1·65	0·31	1·85	2·12	2·07	1949	−1·44	−3·72	−1·94	−0·95	−0·08
1950	0·62	1·32	2·26	3·98	6·89	1950	−2·47	−2·22	−1·17	1·07	5·27
1951	2·58	0·69	1·07	5·62	4·22	1951	−0·69	−2·97	−2·51	3·34	2·57
1952	2·43	1·83	1·13	3·43	3·18	1952	−0·64	−1·49	−2·40	0·57	1·50
1953	2·71	0·93	2·01	3·11	3·89	1953	−0·48	−2·55	−1·57	0·21	2·26
1954	2·69	3·17	3·08	3·38	3·41	1954	−0·40	−0·01	0·08	0·59	1·53
1955	2·31	3·97	1·02	1·06	2·11	1955	−0·71	1·06	−3·62	−2·55	0·17
1956	1·54	1·87	4·22	8·28	3·17	1956	−1·72	−1·61	0·93	5·33	1·61
1957	3·02	1·83	4·48	4·56	5·77	1957	−0·36	−2·26	1·34	1·80	4·18
		Rain-days	(N)					R−P + 5			
1947	19	16	17	5	17	1947	5·09	4·48	4·01	2·07	6·84
1948	6	23	15	22	20	1948	2·66	4·81	2·68	6·67	5·94
1949	15	6	9	12	9	1949	3·56	1·28	3·06	4·05	4·92
1950	6	14	14	23	23	1950	2·53	2·78	3·83	6·01	10·27
1951	12	7	10	17	16	1951	4·31	2·03	2·49	8·34	7·57
1952	12	11	9	13	19	1952	4·36	3·51	2·50	5·57	6·50
1953	12	11	18	18	19	1953	4·52	2·45	3·43	5·21	7·26
1954	10	16	19	21	24	1954	4·60	4·99	5·08	5·59	6·53
1955	18	17	2	8	15	1955	4·29	6·06	1·38	2·45	5·17
1956	16	13	15	21	16	1956	3·28	3·39	5·93	10·33	6·61
1957	13	8	23	20	21	1957	4·64	2·74	6·34	6·80	9·18
		Transpiration (P)						N(R−P + 5) = M			
1947	3·07	3·22	3·18	3·64	1·79	1947	96	72	68	15	116
1948	3·56	3·19	3·40	2·36	1·47	1948	16	119	39	148	119
1949	3·19	4·03	3·79	3·07	2·15	1949	53	8	27	49	44
1950	3·19	3·54	3·43	2·97	1·62	1950	15	39	54	138	236
1951	3·27	3·66	3·58	2·28	1·65	1951	52	14	25	142	160
1952	3·01	3·32	3·53	2·86	2·71	1952	52	39	23	72	123
1953	3·19	3·48	3·58	2·90	1·63	1953	54	27	62	94	138
1954	3·09	3·18	3·00	2·79	1·88	1954	47	80	96	118	158
1955	3·02	2·91	4·64	3·61	1·94	1955	77	103	3	19	78
1956	3·26	3·48	3·29	2·95	1·56	1956	52	44	90	216	106
1957	3·38	4·09	3·14	2·76	1·59	1957	60	22	126	136	192

Year	Total Winter infection	May	June	July	August	September	October	Total Summer infection
			$M \rightarrow M_t$ (Subject to 100 Maximum)					
1947		48	72	68	15	100	50	
1948	273	8	100	39	100	100	50	397
1949	285	27	8	27	49	44	50	205
1950	190	8	39	54	100	100	50	351
1951	290	26	14	25	100	100	50	315
1952	315	26	39	23	72	100	50	310
1953	276	27	27	62	94	100	50	362
1954	348	24	80	96	100	100	50	450
1955	389	39	100	3	19	78	50	289
1956	217	26	44	90	100	100	50	410
1957	302	30	22	100	100	100	50	402

being that in October transpiration is negligible, and consequently, regardless of the amount of rainfall, moisture conditions are rarely unsuitable for the development of the parasite.

The Life Cycle of *F. hepatica* in the Field

In order to determine which monthly indices of potential development must be summated in order to estimate the incidence of disease, some knowledge of the life cycle of the parasite is required. Fascioliasis is endemic in Anglesey so that fluke eggs are passed on to the pastures throughout the year. Those deposited during late autumn and winter in sub-critical temperatures will not develop, but will be subjected to varying environmental conditions throughout this period. When temperatures eventually rise above the critical value in late spring, any of these eggs which subsequently hatch will not make an important addition to those which hatch a little later from eggs deposited on the pastures in spring. Under suitable conditions, these eggs deposited in spring and in early summer hatch, and infect snails,

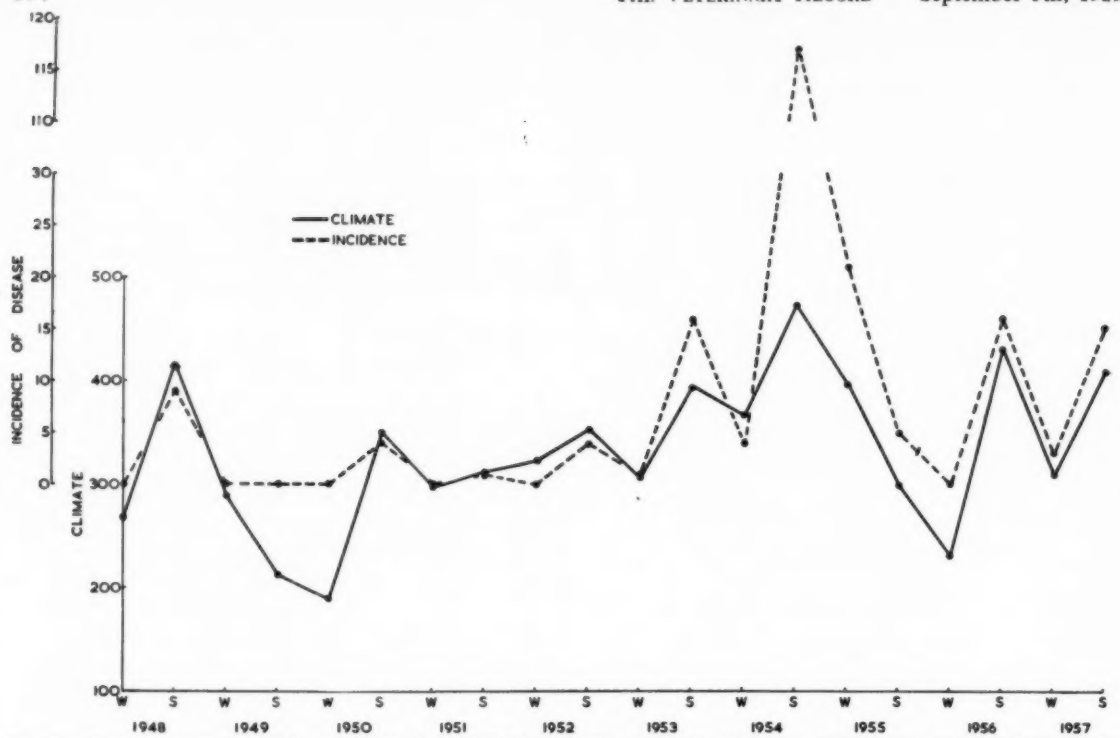

FIG. 1.—Graph showing the incidence of acute fascioliasis based on the results of *post-mortem* examinations on sheep brought into the laboratory, compared with the probable incidence as measured by climate.

the infection passing on to the herbage during late summer and autumn. Sheep losses due to the acute form of the disease arising from this infection usually commence in October, and may continue throughout winter, terminating in early spring. An estimate of the incidence of the disease arising from this source—termed the *summer infection*—may be obtained by summating the values of M_t from May to October inclusive.

Fluke eggs deposited in late summer and early autumn will hatch, assuming moisture conditions are favourable, and infect snails but this infection is unable to develop to maturity in the snail before low winter temperatures limit development. The infection therefore overwinters in the snail, and passes on to the herbage during early summer of the following year. Losses arising from this source—termed the *winter infection*—may commence in July and terminate in October or occasionally November. An estimate of the incidence of the disease arising from this source is obtained by summating the values of M_t for August, September and October of one year with May and June of the next. The value of M_t for July is not included in the estimate of the winter infection since the weather during July has been found to play little part in influencing the course of the winter infection. In years when May and June are dry, the majority of snails carrying a winter infection will have died by the end of June without the infection passing on to the herbage. When May and June are wet, most of the snails also will have died by the end of June, but meanwhile the infection will have passed on to the herbage.

There is thus an important difference between the summer and winter infections. The incidence due to the summer infection is derived from the summation of the indices of potential development of the parasite over 6 months giving a maximum value of $\Sigma M_t = 500$; that of the winter infection over 5 months giving a maximum value of $\Sigma M_t = 400$. It can therefore be concluded that the potential danger to stock from the summer infection is correspondingly greater than that resulting from the winter infection. Confirmation that actual losses of sheep from the acute form of the disease reflect this basic difference between the summer and winter infections is to be seen in Fig. 1.

Although the winter and summer infections have an entirely different origin, losses due to the acute form of the disease caused by the winter infection usually terminate in October, about the same time as the commencement of losses due to the summer infection. This fact occasionally makes it difficult to ascertain whether metacercariae which kill sheep in October result from the summer or the winter infection or from both. It has not been possible to assign such losses to either the winter or summer infections on a simple chronological basis, instead they have been placed in the group which appeared most appropriate in the particular circumstances. For instance (see Fig. 2) losses occurring in October and early November in 1955 (a year which produced

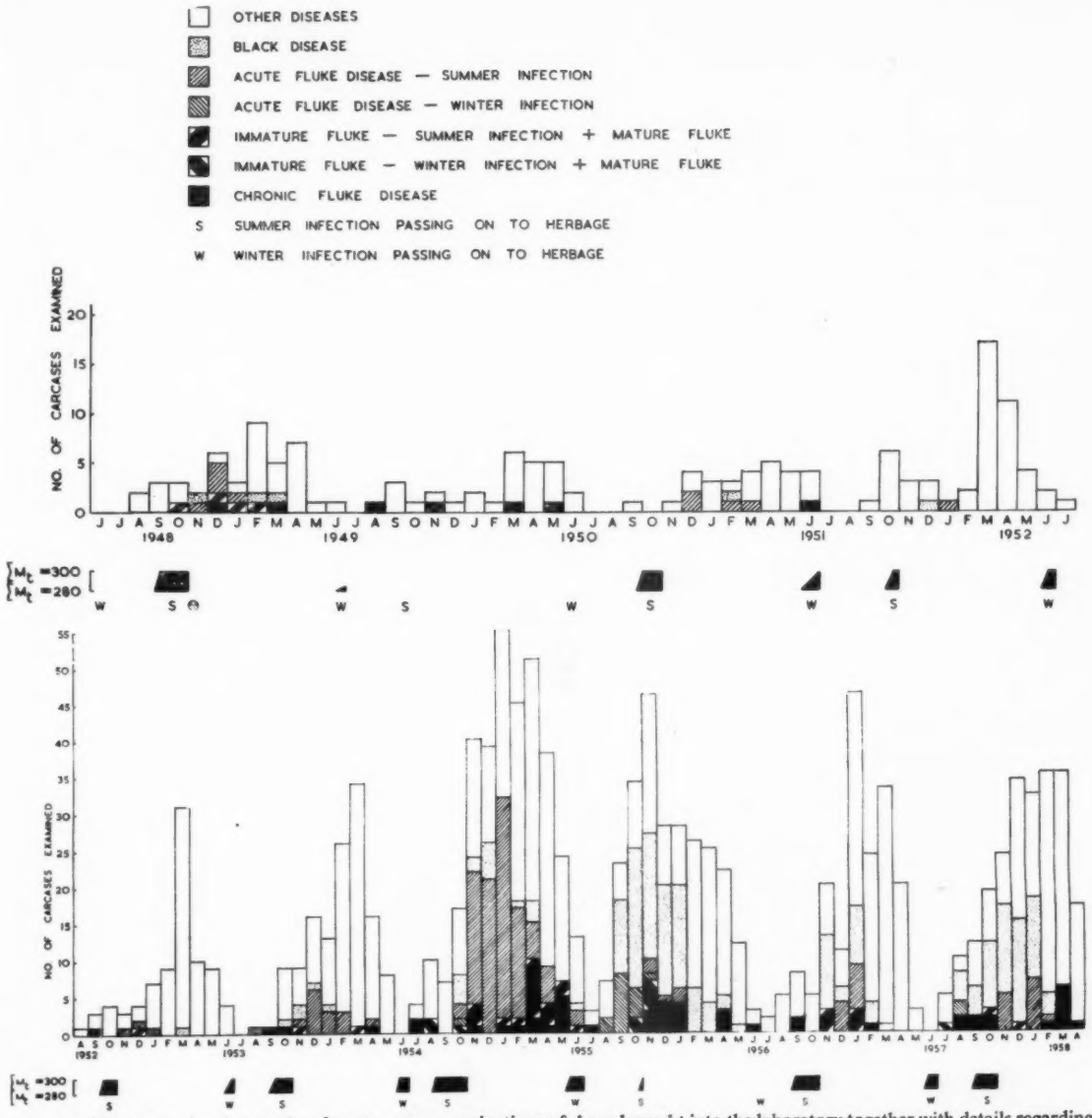

Fig. 2.—Histogram showing results of *post-mortem* examinations of sheep brought into the laboratory together with details regarding the release of metacercariae on to the herbage.

a high winter infection but a low summer infection) have been assigned to the winter infection.

On this basis it has been possible to divide sheep losses into 2 categories ; the number dying as a result of the winter infection in each year, and those dying as a result of the summer infection. In Fig. 1 these figures have been plotted for the period 1948–57. The first figure for each year indicates the losses due to the winter infection ; the second the losses due to the summer infection. The values of Σ M_t which indicate the potential development of the parasite for the corresponding infections are also shown on the same graph*. In this way a comparison is possible between the incidence of acute fascioliasis based on the results of *post-mortem* examinations on sheep brought into the laboratory, and the theoretical incidence as measured by climate.

Correlation Between the Incidence of Disease and Climate

The two curves shown in Fig. 1 demonstrate that there is a reasonable correlation between the incidence of disease and climate for the years 1948–57. It is

* See footnote on page 592.

TABLE III
VALUES OF ΣM_t FOR METEOROLOGICAL STATIONS COVERING ANGLESEY TOGETHER WITH THE NUMBER OF ANIMALS DYING OF ACUTE FASCIOLIASIS BROUGHT INTO THE LABORATORY

	Valley		Aber		Llanerchymedd		Holyhead		Bangor		Average		Deaths	
Year	W	S	W	S	W	S	W	S	W	S	W	S	W	S
48	273	397	267	433	269	426	265	407			268	416	0	9
49	283	203	294	207	284	220	294	222			289	213	0	0
50	190	351	189	365	178	327	200	358			189	350	0	4
51	290	315	303	295	303	327	292				297	312	0	1
52	315	310	300	394	339	359					323	354	0	4
53	276	362	322	385	323	419				420	307	396	1	16
54	348	450	358	477	377	482			388	488	368	474	4	117
55	389	289	400	309	400	306			400	292	397	299	21	5
56	217	410	226	422	239	436			246	458	232	431	0	16
57	302	402	302	402	308	408			321	421	308	408	3	15

W = Winter infection.
S = Summer infection.

more important, however, to compare the corresponding individual figures of losses and climate since in theory each infection is a completely isolated event, conditions which produce one infection being independent of those producing another. Twenty such comparisons are possible (10 winter and 10 summer infections) and from a study of these (see Table III) it appears that the value $\Sigma M_t = 300$ represents the point at which losses from the acute form of the disease commence. Seven average values of less than 300 are recorded (5 winter and 2 summer infections) and in only 1 of these—the summer infection of 1955 which gave a value of 299, were losses recorded. Conversely 13 average values of over 300 are recorded (5 winter and 8 summer infections) and losses occurred in all except 1—the winter infection of 1952 with a value of 323 being the exception.

Another value of interest is $\Sigma M_t = 400$. This would appear to mark the stage at which about 10 cases of acute fascioliasis were diagnosed at the laboratory. The significance of a value of $\Sigma M_t = 400$ and its relationship with the incidence of acute fascioliasis is discussed later. Only one value above 450 is recorded, that of the summer infection for 1954 which gave a value of 474. This was the only season in the period 1948–57 when a severe epidemic was experienced.

The annual data shown in Fig. 1 are analysed on a monthly basis in Fig. 2. This graph also includes in addition to losses from acute fascioliasis those from the chronic form of the disease and from black disease, together with the total number of sheep (not lambs) brought in for examination. In addition it shows a small number of sheep recorded as dying from both mature and immature infections. In Fig. 1 these sheep have been included with those dying of acute fascioliasis. It incidentally shows the importance of liver fluke disease in the county together with the increasing importance of black disease in recent years.

Observations in Anglesey over the period 1955-7 indicate that the infection reaches maturity in the snail when the value of M_t reaches 280. The constancy of this value makes it possible to determine approximately when the herbage is first infected; in addition it has been shown that the infection on the herbage is sufficiently dangerous to produce losses from the acute form of the disease when the value ΣM_t reaches 300. Details of the occurrence of these two levels of herbage infestation during the period 1948–57 are given in Fig. 2. Obviously cercarial production does not cease when the value M_t reaches 300; it is shown as continuing until the end of June in the case of the winter infection, and the end of October for the summer infection. Thereafter, the infection persists on the herbage for a varying time. The continuation of losses from the acute form of the disease for in some cases, 4, 5 and even 6 months after the cessation of cercarial production indicates that numbers of metacercariae may remain viable on the herbage for at least 3 months. It is probable that in those years when conditions are favourable for both the winter and summer infections, viable metacercariae will occur on the herbage from the end of May to the end of December.

The difference in intensity between the winter and summer infections which has already been mentioned earlier is well demonstrated in Fig. 2, and it is obvious also that in most years the summer infection passes on to the herbage in either September or October. This is too late to effect the lamb crop. In those years when the intensity of the winter infection is high, however, a proportion of the lamb livers is likely to be condemned at slaughterhouses.

The relationship in time between the appearance of metacercariae on the herbage and the commencement of losses due to acute fascioliasis also is shown; it can be seen that losses usually commence 2 months after the initial infection of the herbage, and continue for varying periods; the greater the production of metacercariae the longer the period over which the losses occur.

Discussion

The relationship between the incidence of fascioliasis and climate which has now been established provides a basis on which to develop a system of forecasting the probable incidence of disease. Further experience over a number of years will however be needed before such a system can be regarded as completely reliable. Some of the data which has been used in this analysis is not as complete as could have

been wished. For example, a record of the number of carcases brought into the laboratory at Bangor for examination does not constitute a thoroughly reliable basis on which to estimate the incidence of disease. Not only do the number of carcases vary from year to year and season to season, but the sheep population on Anglesey has nearly doubled during the period 1948–57, whilst in recent years it is evident that increasing use of the Veterinary Investigation Centre has been made by farmers in Anglesey. In the absence of any other estimate of the incidence of the disease, however, figures provided by the results of *post-mortem* examinations have had to be used. It is considered that the inevitable variations in the numbers of sheep examined do not invalidate the conclusions reached. They do not, however, permit a precise correlation between climate and the numbers of sheep dying of acute fascioliasis. For this reason only 2 values of ΣM_t *i.e.* those of 300 and 400 have been selected as being significant. A value of $\Sigma M_t < 300$ indicates that no cases of acute fascioliasis are likely to be diagnosed at the Veterinary Investigation Centre. In such seasons the incidence of acute fascioliasis in Anglesey will be negligible. In seasons when 10 or more cases of acute fascioliasis are diagnosed, the value of $\Sigma M_t \geqslant 400$. Although 10 carcases which have died of acute fascioliasis might not appear very significant, examination of the history of such cases received at the laboratory reveals that at least 2 of them would have been brought from farms where 10 or more sheep had died with similar symptoms. It could be concluded that in such seasons, the disease was prevalent on Anglesey.

These 2 values of ΣM_t may therefore be used to classify the incidence of disease into three levels.

$M_t < 300$ little or no disease

$M_t > 300 < 400$ occasional losses—normal for Anglesey

$M_t \geqslant 400$ disease prevalent.

A further value of ΣM_t will become important in the future as more comparisons between the incidence of disease and climate become available. This is the value which corresponds with a severe epidemic. Since only one serious epidemic occurred in the period 1948–57 the value $\Sigma M_t = 474$ must for the present be used to indicate the likelihood of a serious epidemic.

In addition to the difficulty of having to use incomplete data to measure the incidence of disease, it is realised that the method of assessing the effect of climate on the development of the parasite is far from perfect. The effect of temperature on the rate of development for instance is stated to be the same in June, July, August and September, with that in May and October being reduced by half. This is an obvious approximation which makes little allowance for variations of temperature in different months. Furthermore, greater development of the parasite may occur when conditions are favourable over a continuous period of say 3 months, than when there is no such sequence, yet it is possible for the value of M_t to be the same in both cases. Similarly, no means have yet been found of making an allowance mathematically when successive seasons are favourable for development of the parasite, as occurs when a high winter infection follows a high summer infection or *vice versa*. An example of this effect can be seen in the unusually high losses due to the winter infection of 1955 which followed the high summer infection of 1954.

In these circumstances, it is perhaps remarkable that at a stage when the mechanism of the life cycle of *F. hepatica* in the field is only just beginning to be understood, a mathematical formula can be found which may be used to predict the incidence of the disease with any accuracy. The fact that it is possible at this stage to devise a formula derived solely from meteorological data confirms the great dependence of the life cycle on climate.

The Value of a Forecast

The production of a forecast based on the above findings is a relatively simple task. As a practical measure, however, in helping to control fascioliasis, any forecast of the incidence of disease will be of little use to the farmer unless it satisfies certain conditions. In particular, the forecast must be produced sufficiently early to allow any necessary control measures to be undertaken.

Analysis of the example given in Table II shows that in nearly every year the value of M_t for September and October totals 150. The constancy of these two values enables the forecast concerning the summer infection to be made at the end of August, whilst in some years it can be made at the end of July. In either case a forecast can be made before the infection passes on to the herbage so giving the farmer sufficient time to take appropriate measures to combat the summer infection.

The production of a forecast concerning the winter infection is more difficult. The value of M_t for August, September and October is known throughout each winter, but the intensity of the winter infection depends greatly on the climate in the succeeding May and June which makes it impossible to produce a forecast which is both accurate and sufficiently early to be of much use. However, it must be remembered that potentially the winter infection is never as serious as the summer infection, indeed, on the available evidence it can never give rise to a serious epidemic of fascioliasis so that there is not the same need for a forecast. If the winter infection is to constitute any real danger to stock, the value of M_t for August, September and October must record the maximum possible value of 250. In years when this maximum value is recorded it would be possible to issue a warning to the effect that control measures should be undertaken in the event of either May or June becoming abnormally wet.

All control measures, with the exception of drainage, can be improved if they are used in association with the forecast. For instance, molluscicides can be used strategically when a high incidence of disease is expected. They can be applied when the infection is about to pass from the snail to the herbage. The routine dosing of sheep with carbon tetrachloride can be timed to produce more beneficial effects than at present, and farmers fortunate enough

to have adequate grazing can be advised when not to graze "flukey" fields.

Not only could farmers be warned of the approach of "bad fluke seasons," but they could also be informed of the occurrence of years when no or only minor precautions would be required. As a result it is probable that farmers would be more likely to take action at the right time than they do at present, with a consequent improvement in the control of the disease.

A final point concerns the possibility of extending this system of forecasting the incidence of disease to areas other than Anglesey which exhibit the same disease pattern. It is considered that basically this system is applicable in these other areas, although minor alterations would no doubt have to be made. The absence of reliable records of the incidence of fascioliasis is likely to prove the main obstacle in demonstrating the relationship between climate and the incidence of disease.

Acknowledgments.—The authors are grateful to Mr. J. W. Orton, Clarendon Laboratories, Oxford, and Mr. L. P. Smith, Meteorological Office, Harrow, for considerable help and advice. Thanks are also due to Dr. S. B. Kendall for many helpful suggestions during the preparation of this paper.

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Appendix

Definition

Let the probability of fluke disease when rainfall (R) is just equal to transpiration (P) be 'p' (neglecting rain-days)

i.e. when $R - P = O$ let probability $= p$

p is an arbitrary number to be left undetermined for the moment.

Assumption

As (R—P) varies from zero, the probability of fluke disease will vary also. We have no *a priori* knowledge of the nature of this variation but, in general we can assume a linear variation and write

$$\text{probability} = p + nx$$
$$\text{where} \quad x = (R-P)$$

Rain-days

This probability must be corrected for the number of days within a month on which significant rainfall occurs by the introduction of the factor N = the number of Rain-days. (A Rain-day occurs when more than 0·2 mm. of rain falls in 24 hours). Then we can assume that the incidence of fluke disease will be directly proportional to N, and obtain our final probability by multiplying these two quantities together

Probability $= N\ (p + nx) = m$ (say)

Thus $m = N\ (n(R-P) + p)$

$$\frac{m}{n} = N\left((R-P) + \frac{p}{n}\right) = M \text{ (say)} \quad \text{equation (1)}$$

(we can divide through by 'n' because the probability is expressed in completely arbitrary units—it is not "normalised.")

The term $\left(\frac{p}{n}\right)$ is so far undetermined and (so far as our information can tell us) arbitrary.

Value to use for $\left(\frac{p}{n}\right)$

(Concluded at foot of col. 2)

Some Aspects of Intersexuality in Animals*

BY

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Introduction

DURING the past 10 years at the Royal Veterinary College Field Station it has been possible to examine clinically and *post-mortem* a number of animal intersexes. For my contribution this afternoon, I have collected my thoughts on 3 types of intersex, namely, the bovine freemartin, the porcine hermaphrodite and bovine virilism. I will describe the structure of their genital systems, expound on their clinical diagnosis and differential diagnosis, and comment on some features which I think interesting from the standpoint of endocrinology. It will be seen that these 3 examples provide clear evidence of the effects of sex hormones at different ages—in the embryo, at puberty and during sexual maturity.

At the outset it is necessary to appreciate that sex is determined by the hereditary composition of the zygote, whereas differentiation of the sex apparatus is under hormonal control. The earlier in embryonic life the hormonal influence acts the more profound is the resulting change.

Initially all animals have a potential sexual duality and it is the abnormal development of this potential that causes hermaphroditism. Normal animals have vestigial sex organs of the opposite sex, for example, the stallion has a uterus masculinus. Most of the animal intersexes are false hermaphrodites, *i.e.* they have gonads of one sex only and both male and female accessory sex organs.

Hermaphroditism is commonest in goats and pigs.

* Paper presented to a meeting of the Society for the Study of Animal Breeding on February 11th, 1959.

In order to decide on a value for $\left(\frac{p}{n}\right)$ it is necessary to put some figures into the equation

$$\Psi = p + nx$$

The only point about which we can be certain is that the probability (Ψ) of fluke disease will be zero in the driest months, *i.e.* when R—P approaches — 5 in.

If we use this figure we have

$$\Psi = O = p + n\ (-5)$$
$$p = + 5n$$
$$\frac{p}{n} = 5$$

The above is mathematically correct, but we know that the assumption of linear dependence of probability (Ψ) on X cannot be more than a rough approximation. Even so the value of $\frac{p}{n} = 5$ is not unreasonable, it can certainly be expected to lie between 1 and 10.

Substituting the value $\frac{p}{n} = 5$ in equation (1) we have our final equation $M = N\,((R-P) + 5)$

The Bovine Freemartin

The freemartin is an altered female born twin to a bull calf. Its structural deviations, which occur in early embryonic life (after 40 days—Lillie, 1917), depend on two factors, namely, prior differentiation of the testes over the ovaries and anastomosis between the allantoic blood vessels of both foetuses. As a result the development of the female sex organs of the heifer calf is retarded by the androgen from the bull calf, while growth of the vestigtial male sex apparatus of the heifer is stimulated by the same hormone. Typically in the freemartin, except for the vulva and vestibule, the tubular genital tract remains non-patent while its Wolffian system is well developed so that it has, for example, obvious seminal vesicles and vasa deferentia (Figs. 1 and 2). The gonads, remain very small and non-functional. They tend to retain their abdominal location but occasionally one of them particularly the left, descends the inguinal canal and may be felt above the udder of the calf.

Diagnosis

Approximately 11 out of 12 heifers born co-twins to bulls are freemartins. Thus unless the co-twin is of beef breed or not intended for breeding, it is important to find out as soon as possible whether it is a freemartin. For this purpose the best single method available is to investigate the patency of the vagina of the new-born calf with a sound, such as a thermometer. The vagina of the freemartin calf is patent for only 3 inches, or so, whereas a normal heifer calf will accommodate the whole clinical thermometer. Occasionally, however, the vagina of a freemartin is patent as far as the normal position of the cervix where it ends as a gradually narrowing cul-de-sac (Fig. 2). The way to diagnose these occasional cases is to employ a speculum—6-inch by ½-inch glass test tube with the bottom cut off is adequate—and an electric torch, and to explore the anterior vagina for a patent os uteri externum which is absent in the freemartin. Freemartins not diagnosed when calves are likely to attract attention at puberty because they fail to show heat. At this age they may be examined *per rectum* when the absence of a normal uterus in the pelvis is easy to appreciate. Other characters of the freemartin are that its body is high at the withers but has a narrow pelvis ; its clitoris is large and may protrude (Fig. 3) while there is a prominent tuft of hair arising from the inferior vulval commissure (Fig. 4).

FIG. 1.—Internal genitalia of a typical freemartin at puberty. The vagina was patent for nearly 3 inches. The seminal vesicles are conspicuous and in front of them can be seen the central fused Muellerian duct with a Wolffian duct on either side of it.

FIG. 2.—Internal genitalia of a 2-year-old freemartin. The vagina is patent for nearly 6 inches. The left gonad had descended the inguinal canal.

Differential Diagnosis

At breeding age the differential diagnosis of the freemartin is of importance to the veterinary surgeon. The condition which most resembles it is *true genital hypoplasia* with undifferentiated ovaries. These heifers have normal conformation but are anoestrus. Clinical examination reveals a normally patent vagina and cervix but the uterus (Fig. 5) is very

FIG. 3.—External genitalia of a freemartin calf showing a large clitoris.

FIG. 4.—External genitalia of a 4-month-old Jersey calf showing prominent growth of hair from inferior vulval commissure.

small and the ovaries feel like small almonds with no follicles or corpora lutea. The writer has seen 3 such cases, 1 of which was a random abattoir specimen with no history, but the other 2 were both Ayrshires with all-white coat colour, which had remained anoestrus until slaughtered at 4 years old. Hereditary gonadal hypoplasia is well known in the White Swedish Highland breed and it has been stated that White Park cattle may be similarly affected. Closely similar to the freemartin in structure of the tubular genital tract are certain variants of the "*white heifer*" *disease* complex (aplasia of the Muellerian ducts) which are commonest in Shorthorns but have been seen also in other breeds (Fig. 6). These occasional atypical "white heifers" resemble freemartins in that the genital tract, from the meatus urinarius to the oviduct, may lack patency (Fig. 7). They differ in showing oestrous cycles and by having no inordinate development of male sexual vestiges. Normal heifers which display simple functional anoestrus should not be confused with freemartins.

Porcine Hermaphroditism

There are several varieties of porcine intersex. The commonest type looks like a gilt in that it micturates through a subanal genital opening. If missed at castration, no abnormality may be suspected until such an animal reaches puberty. Then, surprisingly, it is seen to take an interest in other gilts—in short to behave like a boar. Closer inspection then reveals that although it has teats and micturates through a vulva there are one or two testicles subcutaneously below the vulva, and the clitoris is now prominent (Fig. 8). Occasionally, both testicles are in the abdomen. Dissection of such a pig shows that, in addition to testicles, there is a tubular genital tract, which typically, is duplicated and consists of uterine horns and vagina as well as epididymes, vasa deferentia and male accessory glands (Fig. 9).

A most interesting feature of these porcine hermaphrodites is that after puberty the female tract is distended by a fluid—undoubtedly uterine secretion—which has accumulated in front of an imperforate or sealed cervix (Fig. 10). In the absence of ovarian tissue one can only conclude that androgen from the testis has exerted a progestational effect on the uterine glands. One cannot but wonder in passing, whether there is from the endocrinological aspect an aetiological relationship between this condition and pyometra in the bitch. Further fascinating observations are that the uterine horn or part of it—particularly on the side of the descended testicle—may negotiate the inguinal canal and come to lie subcutaneously with the testicle, but the descended portion shows less progestational activity. The migration of the uterus may also be due to androgenic secretion of the testis and it recalls the metrocele of the canine species which becomes clinical during pregnancy, pseudo-pregnancy or pyometra when

FIG. 5.—Internal genitalia from a 4-year-old white Ayrshire heifer. Genital hypoplasia with anoestrus. (5/7 natural size.)

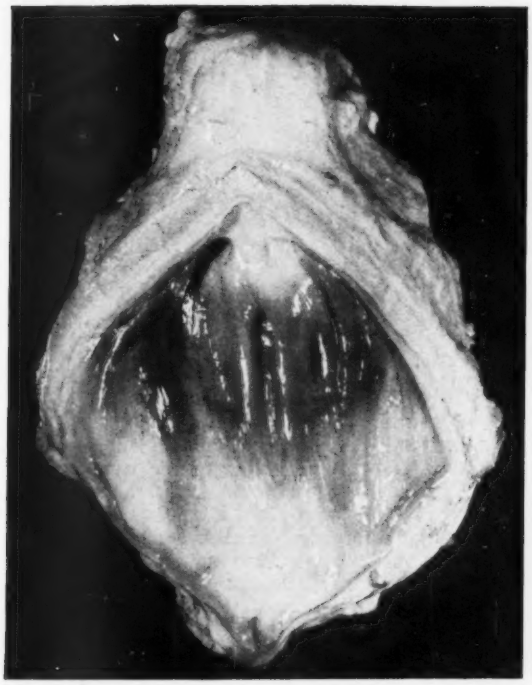

FIG. 6.—Firm hymenal obstruction in an otherwise normal heifer; similar on vaginal examination to a freemartin.

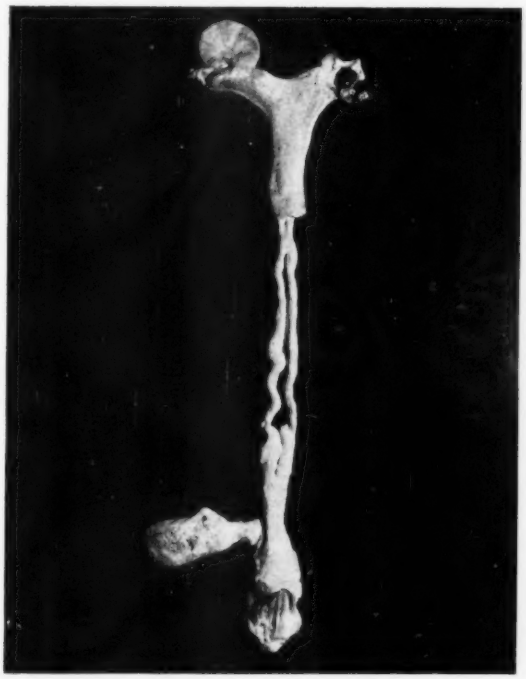

FIG. 7.—An extreme example of aplasia of the Muellerian ducts. The vaginal occlusion is the same as in the freemartin, but there are no Wolffian remnants and this heifer had had oestrous cycles. (C.L. in right ovary.)

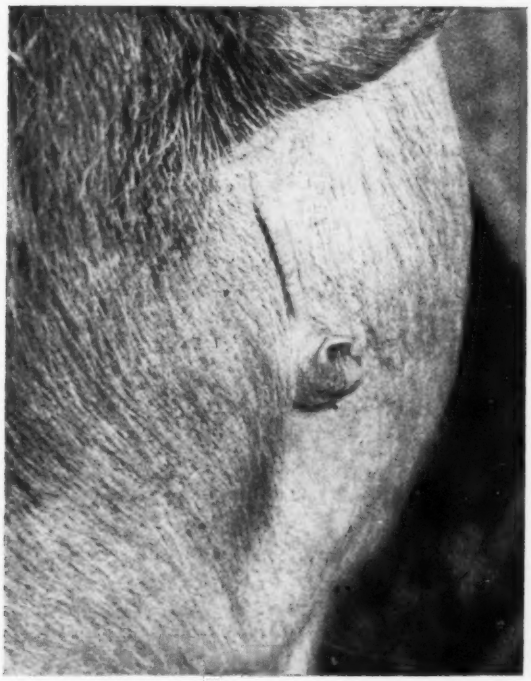

FIG. 8.—External genitalia of a Large White hermaphrodite showing enlarged clitoris and sub-vulval swelling which contained testicle, epididymis and portions of vas deferens and uterine horn.

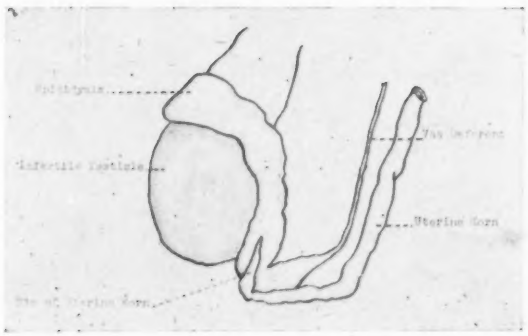

FIG. 9.—Sketch of tissues removed at castration from the hermaphrodite of Fig. 8. The corresponding organs from the other (right) side were in the abdomen.

the animal is under progestational influence from the corpora lutea. The reactions of the uterus of the porcine hermaphrodite seem to support the endocrinologists' contention that there is a close similarity in the endocrine actions of progesterone and testosterone.

Another variety of porcine intersex is where there is an ovary and a testicle, both intra-abdominal, yet the tubular tract is normal female, except that the clitoris becomes large after puberty (Fig. 11). The

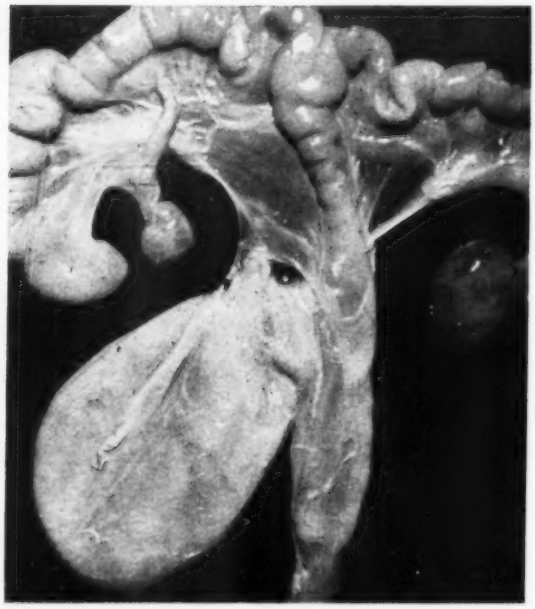

FIG. 11.—Abdominal genitalia of a porcine intersex showing a testicle (right) and ovary (left).

natives of New Hebrides have long been aware that porcine hermaphrodites, which are used in their religious rites, were caused by hereditary influence, and Baker (1925) has observed a frequency of 1 intersex out of 8 among the litters of "carrier" sows. Although Hughes (1927), by demonstrating

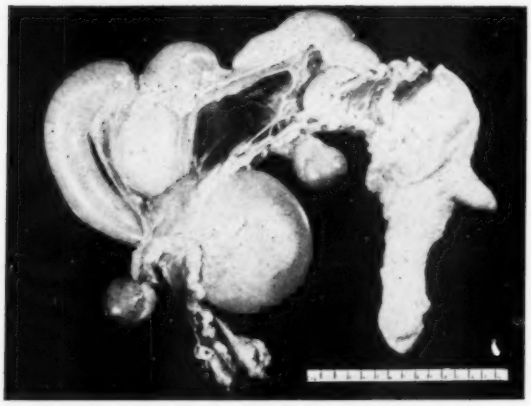

FIG. 10.—Genitalia of an 8-month-old Large White hermaphrodite. The testicles are intra-abdominal and there is marked post-pubertal swelling of the uterus.

vascular anastomosis in one conceptus out of 40 porcine uteri, has shown a basis for the development of an occasional porcine freemartin—she does not think that this is a likely explanation of the condition of hermaphroditism under discussion. It should be remembered that the bovine freemartin is an asexual female individual but the porcine hermaphrodite is functionally a male.

Bovine Virilism

Animals which at birth—and for a variable postnatal period—are of normal sexual structure and function, but which at a later time acquire properties of the opposite sex, are said to undergo sex inversion. An interesting example of this has been seen in cattle and the salient features of it will now be described.

So far the condition has been seen only in Ayrshire cows which throughout their lives were confined indoors. Case histories showed that they had bred normally, usually 3 or 4 calves, but then came a time when, after several services, recurrent cycles ceased and they were thought to be in-calf again. Nothing untoward was suspected until after the lapse of 6 or 7 months when there were no signs of advancing pregnancy. At this stage, investigation of the genital tract by rectal exploration disclosed an empty uterus but with one or both ovaries enlarged by cystic swelling. Further observation revealed that these cows remained in an anoestrous state for many months and the ovaries remained cystic but eventually, sometimes after the lapse of a year or so, the behaviour and the bodily conformation changed. The affected animals appeared to undergo skeletal enlargement and certainly put on weight to reach a maximum of 13 cwt. There was extreme local tissue growth about the crest and the tail-head where massive accumulations of fat occurred. In short, the cow became bull-like and this was particularly apparent in the rounding of the buttocks (Fig. 12). The udder was shrunken but the clitoris was clearly enlarged (Fig. 13). The voice changed to that of a bull and the cow began to seek oestrous females and

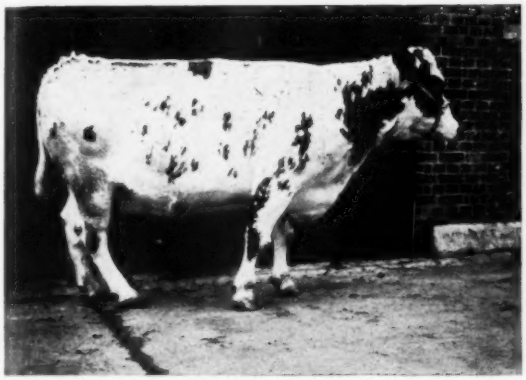

FIG. 12.—Typical conformation of a case of bovine virilism. Contrast with Fig. 14.

FIG. 13.—External genitalia of cow shown in Fig. 12, depicting enlargement of the clitoris.

even to detect the pro-oestrous state and at these times the typical male behaviour of frequent mounting and coital mimicry was shown. In a few cases these pseudo-males actually became aggressive.

Post-mortem examination of these unusual cows in all cases confirmed the clinical diagnosis of cystic ovaries and, in addition, section of the ovaries revealed that the cysts were partly luteinised.

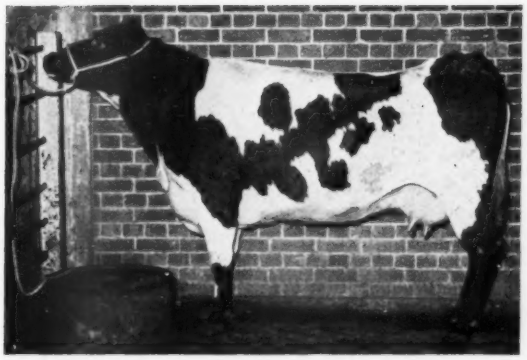

FIG. 14.—Typical conformation of a case of nymphomania.

Discussion

The presence of the luteinised cyst in association with the anoestrous state indicates that the animal was under the influence of progesterone. It may be postulated that long continued progesterone influence exerts a virilising effect and that it was responsible for the partial sex-inversion. It is instructive to compare this abnormal state with advanced pregnancy in the cow. It is not at all uncommon to see cows near to parturition displaying unmistakable signs of masculinity, in particular, by their quest for the oestrous cow and their ability to pick out the pro-oestrous individual; with both they practise coital mimicry. It is assumed that in the normal, pregnant cow, the persistent corpus luteum has a similar virilising effect to the luteinised cyst of the abnormal case.

It cannot be too strongly emphasised that the condition described is quite distinct from nymphomania, which by definition means exaggerated female behaviour (Fig. 14). It also seems to be different from bovine adrenal virilism described by Garm (1949).

Acknowledgments.—I wish to thank Dr. W. S. Gordon for the generous facilities accorded to me at Compton where the kind co-operation of Mr. J. Elliot, M.A., and Mr. R. Summerfield was much appreciated. Messrs. P. Henfrey and W. L. King gave invaluable technical assistance.

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SEASONAL BAN ON STORE POULTRY MARKETS

To reduce the risk of spreading fowl pest, poultry keepers, and auctioneers in England and Wales are reminded that the holding of auction sales of store poultry is prohibited during the months of October, November, and December. During this period no licences can be issued for store poultry markets.

The Official Opening of Congress

Official Opening Ceremony. Seen in the photograph, left to right, are: Mr. J. M. Ingram, Senior Vice-President; the Mayor of Folkestone, Alderman W. M. Harris; the President; the Marquess of Abergavenny; Mr. D. F. Oliver, Honorary Secretary; and Mrs. Hebeler.

THE 77th Annual Congress of the British Veterinary Association was formally opened on the morning of August 31st by the Most Hon. the Marquess of Abergavenny, in the Metropole Hotel, Folkestone. A very large audience of delegates, their wives, and guests was present, and on the platform with the Marquess and the Officers of the B.V.A. was the Mayor, Alderman W. M. Harris, who welcomed the Association to the town.

The President, Mr. H. F. Hebeler, who took the Chair at 10 a.m., said that the Association had already received a great deal of help from the Mayor and the borough of Folkestone in arranging the Congress, and it was with very great pleasure that he introduced the Mayor.

In the course of his speech of welcome, the Mayor said that it was particularly pleasing that a congress having the professional status of the B.V.A. should be held in Folkestone, because Kent was largely an agricultural county and obviously in Kent they knew the work that the profession of veterinary surgery entailed.

He thought it was correct to say, speaking nationally, that the thing which would be most in the forefront of the public mind as their greatest single achievement over the years was the eradication of tuberculosis among cattle.

On the occasion of its last visit 27 years ago, he presumed that the Association, like the Corporation, had not been on quite such a large scale as it was now. He hoped that delegates would go back to their various activities refreshed and with very pleasant memories of the Corporation of Folkestone and with best wishes from this very ancient borough. (*Applause.*)

The President thanked the Mayor and then said it was his great privilege to introduce the Marquess of Abergavenny, who had honoured them by consenting to open the Congress. Lord Abergavenny was a member of one of the most ancient families in England, which had owned estates in Sussex since the 11th century. The Marquess had been a Regular soldier until 1946, when he had returned to the family tradition of farming the estate, which he did on a very large scale. He had recently completed a highly successful programme of land reclamation, having brought 600 acres of parkland into cultivation. The Marquess had a large herd of Ayrshire cattle,

had been President of the British Dairy Farmers' Association in 1955, and was now a vice-President. He was building up a flock of Clun sheep, and intended to expand into the world of beef cattle. The Marquess was also a lover of the horse, and was a member of the Jockey Club and the National Hunt Committee. He had served two terms as a steward of the National Hunt Committee, and had been senior steward in 1954.

They were fortunate to have with them a countryman with such a record of interest and knowledge of the animals which were the basis of their life's work, and he had the greatest pleasure in asking the Marquess to open the Congress.

The Marquess of Abergavenny

The Marquess of Abergavenny, who was received with loud applause, said they would realise that his interest in all these animals had brought him into contact over a long period of years with veterinary surgeons in all walks of life and in all parts of the country, and it was for that reason especially that he was grateful for being given the opportunity to be with them to-day to express his sincere and genuine thanks to all of them, and also individually to many veterinary surgeons who had done such great service to him in the past and to the whole community.

The Congress this week was, he thought, one of the most worthy and deserving which could take place anywhere. Here was a gathering of men and women from the British Isles, and he was pleased to say from overseas as well, who had come together not for any means of furthering their own ends. No mercenary things would come out of this Congress. Members had come together with the object of discussing and divulging methods of improving the care, and curing the sickness, of animals throughout the world. That was a very inspiring thought.

Looking back over the years, he would not reel off the whole list of the profession's technical achievements, but he would agree with the Mayor, who had so rightly said that by far the greatest thing which had been achieved through the work of the veterinary profession was the eradication of tuberculosis. It was a wonderful thing that we were very near to reaching a stage of complete attestation throughout the country—and for that they could take off their hats to themselves, because it was entirely due to them. With sheep, who ever heard of sheep scab now? With pigs, swine fever could be prevented. With dogs, who heard of rabies in this country? Nobody. Hard pad and distemper could be prevented; indeed one could reel off a whole list of things for which the profession had been responsible. But a lot still remained to be done.

Modern farming, if it was going to pay to-morrow, had got to be intensified, and intensified farming meant, whether they liked it or not, meddling with nature, trying to force land to do things which it would not normally like to do in that time; and once one meddled with nature, one was bound to have problems arising, and those new problems were, he was afraid, problems for the veterinary surgeon.

Veterinary Research

One of the handicaps in all forms of research—and it was no exception with veterinary surgeons—was money. It was only too easy nowadays to get anybody to come along and give quite a lot of money as long as there was a quick monetary return; but with veterinary research there was no quick return. Therefore, people who might have money were a bit shy of coming forward to help. If only all those who were connected with animals as their livelihood, or all those who had pets which gave them such happiness during their lives, would give donations each year towards some of the various trusts which existed, or—one did not want them to die too soon—would leave legacies for such things, it would greatly benefit animal research.

He had talked rather a lot about research, but he did not want it to be thought that he was forgetting the men or the women who were to his mind the backbone of the English countryside—the local veterinary surgeons. One might forget at times that before they could become veterinary surgeons, there were the long years of study—five years as a minimum, probably more—and at the end of that there was no guarantee. (*Laughter.*) But who was it that in the middle of the night came down a dirty old farm lane to tend a sick cow? Who on Sunday afternoon when he was just settling into an armchair with the *News of the World* was telephoned by some old lady who said that her favourite "Boggins" had been run over by a car? Who came out in the fog on a winter's night to tend a sick hunter and never complained? The local "vet." He had never had an opportunity of thanking them enough. He hoped he might do so now.

He thanked the President and congratulated him on his year of office. It was well known that the President had done great work. He wished the Congress every success during the coming week. He wished to say one word of welcome to his old friend Mr. Sam Hignett, the President-elect, who would assume the chain of office at the end of the week, and under those guidance he was sure that the British Veterinary Association would continue on the wonderful lines on which it had been running over the past few years.

THE LONDON MEDICAL EXHIBITION

The London Medical Exhibition will take place this year at the New Hall of the Royal Horticultural Society, London, S.W.1, from November 16th-20th inclusive. Times of opening will be 11 a.m. to 6.30 p.m., and on Thursday, November 19th, to 7.30 p.m.

Sir Daniel Davies, K.C.V.O., M.D., F.R.C.P., Extra physician to H.M. The Queen, has kindly consented to perform the opening ceremony at 11.30 a.m. on November 16th.

Once again this exhibition will give members of the profession a splendid opportunity of inspecting the unique range of ethical medical products and surgical instruments, exhibited by the leading manufacturers. Many of the latest developments in medical science will be on show for the first time.

As in previous years a number of important manufacturers have supplied the organisers with medical films which will be shown daily throughout the duration of the exhibition.

The New President of the British Veterinary Association

At the 77th Annual General Meeting, held in Folkestone on Monday, August 31st, Mr. S. L. Hignett was unanimously elected President of the British Veterinary Association for 1959-60. The enthusiasm with which he was accepted is a reflection of the esteem in which Mr. Hignett is held and the warm regard which members feel towards one who has unselfishly served the interests of the veterinary and farming community in so many ways. Few Presidents have had such a full and varied experience in our many-sided profession. Few, when they enter their year of office have already become so widely known and respected by their contributions to veterinary science; few are so ready to put their specialised knowledge and experience at the disposal of the practitioner.

Samuel Leslie Hignett, the son of a Shropshire farmer, was educated at the Priory County School, Shrewsbury and became a student at the Royal Veterinary College and the University of London. After an undergraduate career distinguished in both the academic and athletic sides—he played Association Football for his College and ran for his University—Mr. Hignett obtained his diploma of membership of the Royal College of Veterinary Surgeons in 1931 and graduated B.Sc. in 1932. He forthwith became Demonstrator in Anatomy at the Royal Veterinary College and later lectured in Surgery. After a period as an Assistant Veterinary Officer in the very active department of Birmingham Corporation, teaching and research reclaimed him. He was appointed to the Division of Preventive Medicine in his *alma mater* in 1937. In addition to his part in the work on the cause, treatment and control of bovine mastitis for which the Division earned a world reputation at that time, Mr. Hignett commenced the study of reproductive disorders in cattle and other large animals which became his preoccupation and has earned for him an international reputation. It was about that time that he made a continental tour—a rare happening even in the late '30s—and came under the influence of two of the masters in this field, Professor Folmer Nielson of Copenhagen and Professor Gotze in Hanover, both now deceased.

In 1939 a new phase in his career opened with his appointment by the University of Leeds as Veterinary Investigation Officer for the County of Yorkshire. In its Department of Agriculture he extended his specialised and general interests in co-operation with colleagues in other disciplines and the practitioners in his wide territory. His authority in the field of reproduction was accepted and his work was recognised by the award, in 1941, of the Victory Medal of the Central Veterinary Society.

But a greater opportunity to show his general qualities and to serve the profession in a wider sphere lay immediately ahead. The Wellcome Foundation had purchased the Ely Grange estate at Frant, a few miles beyond Tunbridge Wells. Mr. Hignett was selected to establish and develop the property as the Wellcome Veterinary Research Station, to provide extensive experimental animal breeding units and to engage in research in diseases of animals on a field scale. This afforded an outlet for his wide interests, those of the farmer, the administrator of a large unit and the leader of a research team, yet with the opportunity to continue his own specialist studies. An off-shoot of this life led to his earning the special appreciation of quite a section of the profession for, from 1946, he arranged and largely conducted the refresher courses for demobilised veterinary surgeons which were to prove their value by the crowd of requests which led to the courses being opened to practitioners from both home and overseas. It may well be that 300 veterinary surgeons "passed through his hands," and that is a valuable and memorable experience, if somewhat exhausting! It is to the credit of the Wellcome Foundation that for the second time in the space of little more than 10 years they have made it possible for one of their veterinary staff to undertake this onerous job—presidency of the B.V.A.

Mr. Hignett has already served the Association well. A member of Council of long standing, he first came into prominence for his work in the old Survey Committee. It had many exhausting midnight coffee-drinking sessions, some of which provided much work for the relatively few days between meetings. A slave-driver was in charge—the late Harry Steele-Bodger; Mr. Hignett was one of the slaves and could be excused if he sometimes wonders if the post-war graduates appreciate what was done for the profession in those days—dark as they were in many respects. This work and his continued active participation in its successor, the Technical Development Committee, naturally led him to vice-chairmanship and, in 1956, chairmanship of the T.D.C., which office he only relinquished on being elected Junior Vice-President of the Association. In addition, he has served on the General Purposes and Finance and the Farm Livestock Committees and has been President of 3 Divisions—The Sussex Veterinary Society, the South-Eastern Veterinary Association and the Society for the Study of Animal Breeding.

The Royal College of Veterinary Surgeons has also claimed some of his spare time, as an examiner for 16 years and as an official visitor to various Veterinary Schools—even to an overseas trip as a member of the group which recently reviewed veterinary education in East Africa. The Universities of Cambridge, London and Dublin have had his services as an external examiner in Animal Husbandry. Mr. Hignett is a well-known contributor to veterinary literature, THE VETERINARY RECORD having published many of the 35 papers from his pen.

Throughout this distinguished active career Mr. Hignett has been ably supported by the lady he married in 1933. Mrs. Hignett is well known within the profession by her attendance at Congresses and by the charming way in which she plays hostess to the many who visit Frant. They have two children of school age.

In addition to these professional services and attainments, Mr. Hignett brings to the Presidential

Mr. S. L. HIGNETT, B.SC., M.R.C.V.S., President of the British Veterinary Association, 1959-60

Chair personal qualities which have earned our admiration. An ability to size up a situation quickly, a directness in speech, a strong sense of fair play and a scrupulous integrity will be features in his handling of the situations which arise for our President. Our leadership is in strong vigorous hands and deserves the full support of every member of the Association; certainly all will wish Mr. Hignett a happy journey.

The Junior Vice-President of the B.V.A.

At the Annual General Meeting, Mr. Sydney Jennings, M.R.C.V.S., of the University of Glasgow veterinary school was unanimously, and amid loud applause, elected Junior Vice-President and President-Elect of the British Veterinary Association. Mr. Jennings is very well known in the profession, and his elevation to office will give satisfaction everywhere. He has been a member of the Council for almost 20 years and his colleagues have come to admire and respect the lucidity and good sense with which he always expresses himself. He is personally popular, and will add to the deliberations of the officers and Council not only wisdom, but tact, charm of manner, and an intimate knowledge of the Association.

He has filled a wide variety of offices, which include secretaryship of the Society of Practising Veterinary Surgeons 1940-1946, secretary, Scottish Metropolitan Division 1948-1951, secretary of the Scottish Branch 1953-1959, and President of the West of Scotland Division 1955.

He has served on several of the standing committees of the B.V.A., having been chairman of the Home Appointments Committee and a member of the General Purposes and Finance Committee. He has attended almost every Congress since 1937, and that at Folkestone will remain memorable for him.

Mr. Jennings has written a number of scientific and clinical papers, many of them published in THE VETERINARY RECORD, and has given addresses to Divisions all over the country. The Association may count itself fortunate that a veterinary surgeon and teacher of such ripe experience, sound scholarship, and wide popularity has accepted nomination to succeed to the highest office a year hence.

The New Honorary Secretary

Our readers will know that the honorary secretaryship of the Association is filled each three years, and Mr. D. F. Oliver having served the B.V.A. with great ability since 1956 now gives place to Mr. T. C. Denholm, M.R.C.V.S., who was unanimously elected at the Annual General Meeting last Monday.

The two newly elected Officers of the B.V.A. and their wives. Left to right: Mr. T. C. Denholm, Honorary Secretary, and Mrs. Denholm, Mrs. Jennings, and Mr. Sydney Jennings, Junior Vice-President.

Mr. Denholm, who is in private practice, was educated at Allan Glen's school, Glasgow, and at the Glasgow veterinary school where he qualified in 1944. He was awarded silver medals in Senior Anatomy, Parasitology, and Surgery, and the gold medal for the highest aggregate in professional examinations throughout the five-year course. Having served as assistant in practices in south-west Scotland and the North Riding of Yorkshire, he became principal of his present practice in the spring of 1946.

He has been a member of the B.V.A. for a number of years, and has represented the East Midlands Division on Council since 1955. He was President of that Division in 1956, being one of the joint hosts of the Leamington Spa annual Congress in that year.

Mr. Denholm has won for himself a high reputation in practice, and during his comparatively short period as a member of the Council has earned the respect of his colleagues. Everyone will wish him success in the next three years, during which he has very generously undertaken to serve the Association as one of its officers.

Professional Secretary of the B.V.A.

At the meeting of Council held in Folkestone last Sunday, August 30th, the appointment of Mr. J. A. Anderson, M.R.C.V.S., as Professional Secretary to the Association was approved. Readers will know that it was decided some time ago that such an appointment should be made, and a selection committee interviewed a number of candidates. They were unanimous in their recommendation, and Council greeted Mr. Anderson with acclaim.

He was born in 1912, the son of a chartered accountant, and was educated in Glasgow, the city of his birth. When he entered the university his first intention was to take an honours degree in history, but before so doing he decided to join the profession of publishing and accepted an appointment in that field. He came, however, of farming stock, and after a while tradition led him to consider a career in veterinary surgery and in due course he entered the veterinary school at Glasgow.

At the outbreak of the Second World War he was a senior veterinary student, but volunteered for active service. He was first in the Royal Navy and later transferred to the Royal Air Force, where he became a navigator and bomb aimer and served in those capacities until he was demobilised in 1946. He returned to the Glasgow School and was awarded his professional diploma in 1948.

Having had some association with the pharmaceutical industry he first joined the staff of Messrs. May & Baker to develop the new departments of veterinary information and trials of veterinary products. He remained in that company's service until 1956 when he was appointed Head of the Veterinary Division of Messrs. Bayer Products. By reason of his work in the commercial field he became known to a large number of veterinary surgeons in private practice and also to veterinary research workers, so that he has a wide first-hand knowledge of their problems and their needs. It is testimony to the regard in which he is held that in 1956 he was invited to represent both the British Veterinary Association and the Royal College of Veterinary Surgeons at the Texas Congress of the American Veterinary Medical Association.

Mr. J. A. Anderson, M.R.C.V.S.

Within recent years he has developed a thriving private practice, mainly in the small-animal field. He attributes much of its success to the work of his wife, and those who have the privilege of knowing her assess to the full her great contribution to his successful career as veterinary surgeon and man of business. Conducting his own practice has enriched still further his intimate knowledge of the day-to-day work of the profession.

As indicated in the President's Address (published elsewhere in this issue) Mr. Anderson will be called upon to apply himself to a wide variety of tasks and he is most admirably fitted to do so. He combines with sound professional qualifications and wide experience real devotion to his profession and a desire to serve it. Still youthful, he has maturity of mind and of outlook, together with an unusually attractive personality. It is impossible not to like John Anderson and to trust him implicitly; the Association is fortunate that he has offered his services, and may congratulate itself that in the new Professional Secretary it is appointing a veterinary surgeon of high merit.

News and Comment

THE B.V.A. CONGRESS AT FOLKESTONE

A Royal Message

Just before the opening of Congress, the President addressed the following telegram to the Queen on behalf of the Association: "Members of the British Veterinary Association, attending the opening session of their 77th Annual Congress, send to your Majesty, as their Patron, loyal greetings and their humble duty." The following gracious message was received from Balmoral in time to be read at the Annual General Meeting: "The Queen sincerely thanks the members of the British Veterinary Association attending their Annual Congress for their loyal greetings which Her Majesty as patron greatly appreciates."

The Church Service

The President and Mrs. Hebeler together with the Officers of the Association and the delegates and their wives attended Evensong at St. John's church, Folkestone, last Sunday evening. The vicar welcomed the Association's members in very generous terms and also referred in the course of his sermon to the work done for the community by veterinary surgeons. The second lesson (Matthew xxv. 31) was read by the President.

The Trade Exhibition

Immediately after the Official Opening of Congress, which is reported fully on another page, the President formally declared open the Trade Exhibition. He referred to the indispensable work of the great industry by which the profession is served, spoke of the high quality and great variety of the therapeutic and other materials on exhibition and also called to mind the research work undertaken by many of the important pharmaceutical houses. Mr. Hebeler welcomed the trade exhibitors who, year after year, took a very important place in the Annual Congress, and were indeed part of it.

After a bouquet had been presented by the exhibitors' committee to Mrs. Hebeler, she together with Lord Abergavenny, the President, and the Officers made a tour of the exhibition which was housed in the Metropole Hotel.

The Local Divisions' "At Home"

The traditional "At Home" which always opens the Annual Congress on such a happy note was held at the Metropole Hotel last Sunday evening. The two host Divisions—the Sussex and the South

The two Presidents of the host Divisions and their wives welcome the President of the B.V.A. and Mrs. Hebeler. Our photograph shows, left to right: Mrs. Hebeler, the President, Mr. P. R. Blair-Fish, Mrs. Peyton, and Mr. G. S. Peyton.

Eastern—had provided a very generous buffet which was thoroughly enjoyed by the very large number of delegates, their wives, and friends who were

Mr. Field is seen with Mr. J. M. Ingram, Senior Vice-President of the B.V.A., at the "At Home" which opened Congress week.

present. Mr. Peyton made a brief speech to which the President responded, expressing the company's warm appreciation of the hospitality offered by the two Divisions. By general consent this was a most enjoyable beginning to the week.

The "At Home" is under way. Everybody seems to be enjoying himself. Things are in excellent shape and nothing has been forgotten. Mr. P. M. Sambrook, Honorary Secretary of the Congress Committee, and Mr. J. Wright, Honorary Secretary, cautiously relax.

SENIOR MINISTRY APPOINTMENTS

Mr. D. W. Menzies was appointed on May 1st to fill the new post of Deputy Director of the Veterinary Investigation Service.

Dr. E. L. Taylor, Deputy Director of the Ministry's Veterinary Laboratory at Weybridge, retired under the age limit on June 30th. He will, however, continue to serve the Ministry as a research worker. Mr. H. I. Field was promoted to the vacant office of Deputy Director as from July 1st.

RESEARCH ON BROILER HOUSING

The need for research on the housing requirements of broiler chickens has been generally recognised; and in order to carry out studies on this problem three types of broiler houses have been erected at the Cambridge School of Veterinary Medicine. The research project is under the direction of Dr. D. W. B. Sainsbury and has been financed by over twenty industrial organisations.

The three buildings are, in each case, a form of construction that is suitable not just for broilers, but equally for general use in livestock buildings that require controlled conditions—for example, laying houses, piggeries, and calf houses. A wide range of brooding, heating, ventilating, lighting, and feeding equipment has been installed. The houses are now completed and in operation.

The results of the trials will be made available from time to time. Short-term results bearing on the practical aspects of the construction, materials, heating, and ventilation should be elucidated more speedily than the longer term aspects of the research, which will aim to define more accurately the optimum environmental requirements of the birds.

WORLD CATALOGUE OF VETERINARY FILMS

A "List of Veterinary Films and Films of Veterinary Interest" containing 735 films was published in May. This catalogue was compiled by the secretariat of the Permanent Committee for the International Veterinary Congresses (now the Permanent Committee of the World Veterinary Association), under the direction of Professor Dr. L. de Blieck who started the work in 1949. Enquiries have been made in 39 different countries as to the availability of such veterinary films, and 24 countries have assisted in evaluating the films suggested for inclusion in the booklet.

As far as possible the title, sponsor, year of production, producer, running time, sound or silent, colour or black-and-white, 35 or 16 mm., synopsis type/grading, language(s), owner of rights, and address for enquiries are all given, and it is hoped

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The President's Address—*Concluded.*

this should aspire to the position for it can do him nothing but good. I would ask you also, as in previous years, to spare a little thought for the family and colleagues of a President, especially one in practice, who also have a difficult year without any of the compensations.

Once again I thank you for the honour you have done me in electing me as your President and, finally, for listening to me with such patience.

to issue an appendix to this catalogue at two-yearly intervals.

The catalogue is available at the equivalent of 5 Dutch guilders which should be remitted to the account of the Permanent Committee of the World Veterinary Association with the Nederlandsche Handel Maatschappij N.V. in Utrecht (The Netherlands).

THE XIIth CONGRESS OF THE INTERNATIONAL SCIENTIFIC FILM ASSOCIATION

The XIIth Congress of the International Scientific Film Association (ISFA) was held in Moscow from September 10th to 20th, 1958, and was attended by representatives from 32 countries and various international organisations. Fourteen veterinary films, selected in consultation with the film section of the World Veterinary Association, were shown to the delegates who discussed problems concerning the use of such films in secondary schools, universities, and professional training courses. The films were of particularly good quality and included:—

"Klauenamputation beim Rind," German Federal Republic; "Industrielles Kälberschlachten," German Democratic Republic; "Medikamentöses Niederlegen (Pferd)," "Intubationsnarkose (Pferd, Hund)," Austria; "Rabies in cattle and domestic animals," Bulgaria; "Carcinome du caecum," Argentina; "La Rhinite atrophique du porc," France; "Xylocain in veterinary surgery," Sweden; "Recording blood pressure during operation," Sweden; "Syngamosis," Yugoslavia; "Newcastle Disease," Yugoslavia; "Les maladies des abeilles (Diseases of bees)," Switzerland; "La vie des abeilles (Life of bees)," Switzerland; "Principes de l'anatomie des animaux domestiques," U.S.S.R.; and "Etude de l'effet de radiation sur des cellules d'organes hématopoiétiques en culture de tissu," U.S.S.R.

The structure of the ISFA has been modified in the past year. The Association is still directed by a Council of some 15 members representing as many countries, but the executive body now consists of 3 committees only: one for research, one for education, and one for popular science. At the final session of the Congress the new presidium was elected and Mr. A. Zgouridi (U.S.S.R.) became President, with Mr. Luc Haesaerts (Belgium) and Mr. J. W. Varossieau (The Netherlands) as Vice-Presidents. The President of the permanent committee for films on research is Dr. R. Robinaux (France).

THE COLONIAL VETERINARY SERVICE

Mr. T. M. Leach, M.R.C.V.S., D.V.S.M., ex-Sudan and Chief Veterinary Research Officer, Northern Nigeria, has been appointed Deputy Director of the West African Institute for Trypanosomiasis Research, Kaduna, Northern Nigeria.

BRITISH COUNCIL BOOK EXHIBITION IN SOMALIA

The British Council's first exhibition to be sent to Somalia will be seen at the Fifth International Trade Fair, Mogadishu, from September 28th to October 12th.

On display will be more than 550 books in sections on agriculture, health and hygiene, science (including geography), social sciences (including economics and commerce), the teaching of English, and books for children and young people.

Linked to this will be a selection of some 90 British periodicals concerned with agriculture and animal husbandry, and THE VETERINARY RECORD will be among those to be displayed on the British stand.

MR. KEITH ENTWISTLE

Mrs. J. Adams writes:—

I should like to pay a tribute to Keith Entwistle, who died so tragically on August 19th. I knew him not only as a brilliant veterinary student but also as a great friend. Keith stayed in my home many times. To have him around was a great pleasure; he was such an exhilarating conversationalist on all topics and he was always thoughtful and kind. He was exceptionally knowledgeable on poetry and music. Money and fame meant nothing to him for all he asked was to be allowed to apply his knowledge to aid others, and he was completely selfless. It was indeed a privilege to have known him; his untimely death is a great loss to the field of science and to all mankind.

SWINE FEVER INFECTED AREA

The area described in the schedule below is declared to be an infected area, and the Swine Fever (Infected Areas) Special Order No. 2, 1959, will come into operation on September 6th.

The area comprises:—

The Cities and County Boroughs of Liverpool, Manchester, and Salford.

The County Boroughs of Blackburn, Blackpool, Bolton, Bootle, Burnley, Bury, Oldham, Preston, Rochdale, St. Helens, Southport, Warrington, and Wigan.

The Boroughs of Accrington, Ashton-under-Lyne, Chorley, Colne, Darwen, Eccles, Haslingden, Heywood, Leigh, Middleton, Mossley, Nelson, Rawtenstall, and Widnes.

IN THE COUNTY OF LANCASTER

The Petty Sessional Divisions of Garstang, Amounderness, Clitheroe, Burnley and Colne, Blackburn, Walton-le-Dale, Leyland, Fylde, Leyland Hundred, Darwen, Rossendale, Church, Bolton, Bury, Rochdale County, Oldham, Ashton-under-Lyne, Manchester, Leigh, Warrington, Wigan, Ormskirk, Southport, Prescot, Widnes, and Liverpool County.

PERSONAL

Marriage

HILLER—WOOLDRIDGE.—The marriage took place on Saturday, August 29th, 1959, between Roger George Hiller, B.A., younger son of Mr. G. A. Hiller, Chief Public Health Inspector of the City of Leicester, and Mrs. Hiller of 65, Lutterworth Road, Leicester, and Sylvia Rosalie Wooldridge, B.A., only daughter of Dr. W. R. Wooldridge, M.SC., F.R.C.V.S., F.R.I.C., Scientific Director of the Animal Health Trust, and Mrs. Wooldridge of Bentley Hyde, Priory Drive, Stanmore, Middlesex.

The Reverend E. J. C. Haselden, M.A., Vicar of Holy Trinity, Leamington, previously of Holy Trinity, Leicester, officiated at the Service which was held at St. John's Church, Stanmore. The bride was attended by her cousin, Miss Linda Wooldridge, and Miss Gillian Hiller; Mr. D. J. Bradley officiated as best man. Some 200 guests were present at the reception at the bride's house.

Mr. Roger Hiller is at present undertaking botanical research at Queen Mary College, London, and his wife is a junior lecturer in Zoology at the Chelsea College of Science and Technology.

Birth

WRIGHT.—On August 22nd, 1959, to Wendy, wife of Michael Wright, M.R.C.V.S., Grove House, Ryles Park Road, Macclesfield, a son, Stephen Michael Hartley, brother for Susan.

COMING EVENTS

September

9th (Wed.). Meeting of the Lincolnshire and District Division at the Berkeley Hotel, Doncaster Road, Scunthorpe, 2.15 p.m.

16th (Wed.). General Meeting of the South Wales Division at the University of Wales, Geography Dept., Alexander Road, Aberystwyth, 2.15 p.m.

Meeting of the Welsh Branch to be held jointly with the South Wales Division, as listed above.

17th (Thurs.). Autumn Meeting of the East Midlands Division at the Priory, Thurgarton, Notts., 12.45 p.m.

23rd (Wed.). General Meeting of the Lancashire Veterinary Association, Patton Arms, Warrington, 7.45 p.m.

24th (Thurs.). Meeting of the Supplementary Veterinary Register Division at 7, Mansfield Street, W.1, at 3 p.m. Committee meeting at 2 p.m.

25th (Fri.). Meeting of the North Wales Division at the Department of Agricultural Chemistry, Bangor, 2 p.m.

Meeting of the Shropshire Veterinary Club at the Oak Hotel, Shelton, Shrewsbury, 8 p.m.

30th (Wed.). Meeting of the Southern Counties Veterinary Society at the Royal Hotel, Winchester, 7.30 p.m.

30th September, 1st and 2nd October (Wed., Thurs. and Fri.). Quarterly Meeting of Council, R.C.V.S.

October

1st (Thurs.). Banquet of the Welsh Branch at the City Hall, Cardiff.

Letters to the Editor

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

The B.S.A.V.A. Congress, 1960

Sir,—I have been asked by the organising committee for the 1960 British Small Animal Veterinary Association to write to you concerning the provisional programme arrangements, and to give you the dates and venue to enable readers to make forward plans.

The Congress will again be held at The Washington Hotel, Curzon Street, London, W.1, on Friday, Saturday, and Sunday, March 18th, 19th, and 20th.

The highlight of the Congress will undoubtedly be the two sessions on Friday and Saturday afternoon using closed-circuit colour television for demonstration of surgical and other procedures. This will be the first occasion when colour television has been used for a veterinary congress anywhere in the world, and the committee are planning the programme to ensure that it will be used to the best advantage.

The Congress will follow the usual pattern with a trade exhibition adjoining the Congress Hall, and an interesting social programme for wives is being arranged by the Ladies' Social Committee.

Two major sessions will be devoted to a discussion on skin diseases and nutrition, and some leading authorities on these subjects have been commissioned to present papers. It is hoped to invite some overseas veterinary surgeons to address the Congress, with particular reference to small-animal practice in their countries.

It is also hoped to arrange a panel including overseas guests to discuss individual clinical cases presented through the colour television medium under the heading "What is your diagnosis?"

Full details will be published as usual in THE VETERINARY RECORD and members will receive early notification through the post. In the meantime, it is suggested that members make direct provisional bookings with the hotel to ensure that accommodation will be available for them.

Yours faithfully,

G. N. HENDERSON,
B.S.A.V.A. Public Relations Officer.

The Distillers Company (Biochemicals) Ltd.,
Broadway House,
The Broadway,
Wimbledon,
London, S.W.19.

August 26th, 1959.

ADVERTISERS' ANNOUNCEMENTS

CIBA announce the introduction of 3 preparations based on Vioform, which will be promoted to veterinary surgeons:—

VIOFORM SCOUR PASTE is packed in two-ounce tubes and contains 0.25 g. in 1 inch of paste. It is formulated for the treatment of scour in piglets. Simply applied as a lick on the tongue, it is much more convenient and effective than tablets as a method of administration to piglets.

VIOFORM TABLETS 0.25 g. in packs of 30 and 200. These tablets are mainly for the treatment of scour in calves and infective diarrhoea in dogs and cats.

VIOFORM-HYDROCORTISONE SALVE contains 3 per cent. Vioform and 1 per cent. Hydrocortisone in an emollient base. 5-g. tubes. Vioform-Hydrocortisone Salve effectively controls both inflammation and infection in skin disorders.

GLAXO LABORATORIES LTD. announce that a new pack of Predsolan Tablets is now available in a bottle of 100 tablets (1 mg. prednisolone).